AF/1751

PATENT
Customer No. 22,852
Attorney Docket No. 5725.0555-00

APPEAL TO THE BOARD OF PATENT APPEALS AND INTERFERENCES

In re Application of:

Mireille MAUBRU et al.

Application No.: 09/486,558

Filed: February 29, 2000

For: DYEING COMPOSITION FOR KERATIN FIBRES

Group Art Unit: 1751

Examiner: M. Einsmann

#17 + Reply Brief
2-21-02

Commissioner for Patents and Trademarks
Washington, DC 20231

Sir:

TRANSMITTAL OF APPEAL BRIEF (37 C.F.R. 1.192)

Transmitted herewith in triplicate is the APPEAL BRIEF in this application with respect to the Notice of Appeal filed on November 14, 2001.

This application is on behalf of

☐ Small Entity ☒ Large Entity

Pursuant to 37 C.F.R. 1.17(f), the fee for filing the Appeal Brief is:

☐ $160.00 (Small Entity)

☒ $320.00 (Large Entity)

TOTAL FEE DUE:

Appeal Brief Fee	$320.00
Extension Fee (if any)	$110.00
Total Fee Due	$430.00

☒ Enclosed is a check for $430.00 to cover the above fees.

FINNEGAN
HENDERSON
FARABOW
GARRETT &
DUNNER LLP

1300 I Street, NW
Washington, DC 20005
202.408.4000
Fax 202.408.4400
www.finnegan.com

PETITION FOR EXTENSION. If any extension of time is necessary for the filing of this Appeal Brief, and such extension has not otherwise been requested, such an extension is hereby requested, and the Commissioner is authorized to charge necessary fees for such an extension to our Deposit Account No. 06-0916. A duplicate copy of this paper is enclosed for use in charging the deposit account.

FINNEGAN, HENDERSON, FARABOW,
GARRETT & DUNNER, L.L.P.

Dated: February 14, 2002

By: _____
Mark J. Feldstein
Reg. No. 46,693

FINNEGAN
HENDERSON
FARABOW
GARRETT &
DUNNER LLP

1300 I Street, NW
Washington, DC 20005
202.408.4000
Fax 202.408.4400
www.finnegan.com

PATENT
Customer No. 22,852
Attorney Docket No. 5725.0555-00

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

In re Application of:	
Mireille MAUBRU et al.	Group Art Unit: 1751
Application No.: 09/486,558	Examiner: M. Einsmann
Filed: February 29, 2000	
For: DYEING COMPOSITION FOR KERATIN FIBRES	

Commissioner for Patents and Trademarks
Washington, DC 20231

Sir:

APPEAL BRIEF UNDER 37 C.F.R. § 1.192

In support of the Notice of Appeal filed November 14, 2001, and pursuant to 37 C.F.R. § 1.192, Appellants present in triplicate this brief and enclose herewith a check for the fee of $320.00 required under 37 C.F.R. § 1.17(c).

This appeal is in response to the final rejection dated June 14, 2001, of claims 20-47, which are set forth in the attached Appendix. If any additional fees are required or if the enclosed payment is insufficient, Appellants request that the required fees be charged to Deposit Account No. 06-0916.

I. Real Party In Interest

L'Oréal S.A. is the assignee of record.

FINNEGAN
HENDERSON
FARABOW
GARRETT &
DUNNER LLP

1300 I Street, NW
Washington, DC 20005
202.408.4000
Fax 202.408.4400
www.finnegan.com

II. Related Appeals and Interferences

Appellants' undersigned legal representative knows of no other appeals or interferences which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

III. Status Of Claims

Claims 20-47 are pending in this application. No claims have been allowed. Claims 20-47 have been finally rejected under 35 U.S.C. § 103(a).

IV. Status Of Amendments

All amendments have been entered, and no amendments under 37 C.F.R. § 1.116 have been filed.

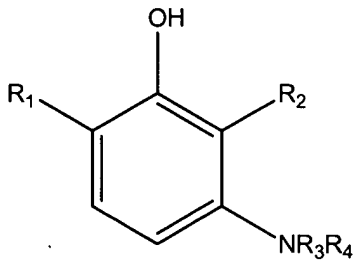
V. Summary Of Invention

The present invention relates to a composition for the oxidation dyeing of keratin fibres, in particular human keratin fibres such as the hair, comprising at least one oxidation base chosen from diaminopyrazoles and triaminopyrazoles, in combination with at least one meta-aminophenol which is halogenated ortho to the phenol, as coupler, and to the dyeing process using this composition with an oxidizing agent, as more specifically set forth in the specification and claims. Page 1, lines 5-12.

More specifically, the present invention relates to a composition for the oxidation dyeing of keratin fibers comprising (1) at least one oxidation base chosen from diaminopyrazoles, triaminopyrazoles, and acid-addition salts thereof; and (2) at least one coupler chosen from halogenated meta-aminophenols of formula (I), and acid addition salts thereof:

FINNEGAN
HENDERSON
FARABOW
GARRETT &
DUNNER LLP

1300 I Street, NW
Washington, DC 20005
202.408.4000
Fax 202.408.4400
www.finnegan.com



(I)

in which (a) R_1 and R_2, which are identical or different, are chosen from a hydrogen atom, a halogen atom, a C_1-C_4 alkyl radical, a C_1-C_4 monohydroxyalkyl radical, a C_2-C_4 polyhydroxyalkyl radical, a C_1-C_4 alkoxy radical, a C_1-C_4 monohydroxyalkoxy radical and a C_2-C_4 polyhydroxyalkoxy radical; (b) R_3 and R_4, which are identical or different, are chosen from a hydrogen atom, a C_1-C_4 alkyl radical, a C_1-C_4 monohydroxyalkyl radical, a C_2-C_4 polyhydroxyalkyl radical and a C_1-C_4 monoaminoalkyl radical; and (c) with the proviso that at least one of said radicals R_1 and R_2 is a halogen atom. See, e.g., claim 20.

VI. Issues

Whether claims 20-47 are patentable under 35 U.S.C. § 103(a) over U.S. Patent No. 3,918,896 (*Kalopissis*) in view of U.S. Patent No. 5,061,289 (*Clausen*).

VII. Grouping Of Claims

Each claim of this patent application is separately patentable, and upon issuance of a patent will be entitled to a separate presumption of validity under 35 U.S.C. § 282. For convenience in handling this Appeal, however, the claims will be grouped in one group. Thus, pursuant to 37 C.F.R. § 1.192(c)(7), in this Appeal, the rejected claims will stand or fall together.

FINNEGAN
HENDERSON
FARABOW
GARRETT &
DUNNER LLP

1300 I Street, NW
Washington, DC 20005
202.408.4000
Fax 202.408.4400
www.finnegan.com

VIII. Argument

The Examiner rejected claims 20-47 under 35 U.S.C. § 103 as unpatentable over Kalopissis in view of Clausen. This is the sole ground of rejection currently outstanding in the present application, and is the sole ground of rejection under appeal. The Examiner proposed two distinct arguments in support of this rejection. Specifically, the Examiner proposed (1) a substitution argument and (2) a separate combination argument. However, both arguments conflict with the express teachings of the references, and both arguments are insufficient to establish a *prima facie* case of obviousness. Further, even if not contrary to the express teachings of the references, the alleged motivation relied upon by the Examiner is not specific to the proposed combination, and is insufficient to establish a *prima facie* case of obviousness.

A. The Examiner's substitution argument is in direct conflict with express teachings of both the primary and the secondary references

In the Office Action dated December 22, 2000, and in the final Office Action dated June 14, 2001, the Examiner proposed the substitution or replacement of a p-aminophenol oxidation base in Kalopissis with a diaminopyrazole from Clausen. Specifically, the Examiner argued that

> [i]t would have been obvious to... substitute the p-aminophenol oxidation base of Kalopissis, such as in the patentee's Examples 22, 27 and 32, with a diaminopyrazole as claimed... because Clausen teaches that the claimed diaminopyrazoles are an improvement over p-aminophenol because they have better physiological properties. Furthermore, Clausen teaches that the claimed diaminopyrazoles obtain brilliant red shades when combined with conventional couplers, further motivating those skilled in the art to replace Kalopissis's red oxidation base p-aminophenol with a diaminopyrazole oxidation base...

FINNEGAN
HENDERSON
FARABOW
GARRETT &
DUNNER LLP

1300 I Street, NW
Washington, DC 20005
202.408.4000
Fax 202.408.4400
www.finnegan.com

Office Action of December 22, 2001, page 5; final Office Action of June 14, 2001, pages 3-4 (emphasis added). However, the Examiner's substitution argument fails to establish a *prima facie* case of obviousness based on Kalopissis in view of Clausen for at least the reason that Kalopissis expressly teaches that p-aminophenol is an essential feature, so it cannot be eliminated by substitution or replacement.

a) First, Kalopissis specifically teaches that "[t]he dye compositions according to the invention are characterized by the following **essential features**... they **must** contain a paraphenylenediamine or a **paraaminophenol** or a heterocyclic oxidation base such as 2,5-diaminopyridine or 2-hydroxy-5-aminopyridine." Col. 2, line 67 - col. 3, line 5 (emphasis added). The above-cited teaching of Kalopissis is not directed just to a single embodiment of the invention, nor is it directed only to a set of preferred embodiments. Rather, Kalopissis' clear and unequivocal teaching of "essential features" refer to the Kalopissis invention as a whole.

Consequently, the Office's argument that "[i]t would have been obvious... to at least partially substitute the p-aminophenol oxidation base of Kalopissis... with diaminopyrazole" is directly counter to the express teachings of Kalopissis that paraaminophenol (or another of Kalopissis' specifically identified bases[1]) is a necessary element of the Kalopissis composition. That is, the Office's suggested combination **changes the principle of operation of Kalopissis,** by eliminating paraaminophenol, an "essential feature" of the reference.

However, when a proposed modification of a reference destroys its intended function, then the requisite motivation to make the modification does not exist. See *In re*

FINNEGAN
HENDERSON
FARABOW
GARRETT &
DUNNER LLP

1300 I Street, NW
Washington, DC 20005
202.408.4000
Fax 202.408.4400
www.finnegan.com

Fritch, 23 U.S.P.Q.2d 1780, 1783 n.12 (Fed. Cir. 1992) ("A proposed modification [is] inappropriate for an obviousness inquiry when the modification render[s] the prior art reference inoperable for its intended purpose."). Further, when "the proposed modification or combination of the prior art would change the principle of operation of the prior art invention being modified... the teachings of the reference are not sufficient to render the claims *prima facie* obvious." *See* M.P.E.P. §2143.01 (citing *In re Ratti,* 123 U.S.P.Q. 349 (CCPA 1959)). In the present case, the Examiner's proposal to remove an essential feature (paraaminophenol) of Kalopissis is clearly changing its principle of operation, and, thus, the proposed combination fails to support a *prima facie* case of obviousness.

Second, Appellants respectfully submit that there could be no clearer case of a reference teaching away from a proposed combination than the present case. Specifically, the Examiner proposed that "[i]t would have been obvious... to at least partially substitute the p-aminophenol oxidation base of Kalopissis... with diaminopyrazole." However, Kalopissis specifically teaches away from such a proposed substitution by stating that, rather than being amenable to substitution or elimination, paraaminophenol (or another of the specifically identified bases) is **essential** to the combination and **must** be present.

In *Winner Int'l Royalty Corp. v. Ching-Rong Wang*, 202 F.3d 1340, 53 U.S.P.Q.2d 1580 (Fed. Cir.2000), the Federal Circuit addressed similar facts of a

FINNEGAN
HENDERSON
FARABOW
GARRETT &
DUNNER LLP

1300 I Street, NW
Washington, DC 20005
202.408.4000
Fax 202.408.4400
www.finnegan.com

[1] Note that the Examiner does not propose, and has no basis or evidence from which to propose, that the paraaminophenol containing composition of Kalopissis further comprise either paraphenylenediamine or heterocyclic oxidation bases, the other possible essential features of Kalopissis.

reference teaching away from a proposed modification, and held that the invention was not obvious over the proposed modification. Winner's invention was a self-locking steering wheel anti-theft device using a ratcheting mechanism. The prior art Johnson patent used a dead-bolt which required a key. The prior art Moore patent described a ratcheting mechanism. The issue was whether there was any reason to substitute the more convenient ratcheting mechanism of Moore for the more secure dead-bolt of Johnson.

Winner argued that Johnson taught away from Moore. The Federal Circuit noted; "Trade-offs often concern what is feasible, not what is, on balance, desirable. Motivation to combine requires the latter." Citing *In re Gurley*, 27 F.3d 551, 553, 31 USPQ2d 1130, 1131 (Fed. Cir. 1994), the Federal Circuit found that the emphasis on security in Johnson's specification meant there was no motivation to combine it with Moore and thus replace the desired, secure dead-bolt with a more convenient ratcheting mechanism. *Winner* at 1350. For this reason, the court held that the suggested combination failed to establish a *prima facie* case of obviousness.

Similarly, the Examiner has proposed removing an essential feature of Kalopissis, and replacing it with different feature based on Clausen. However, just like *Winner*, given Kalopissis' emphasis on paraaminophenol as an essential feature, Kalopissis teaches away from this substitution. Accordingly, there is no motivation or desire to modify Kalopissis by replacing Kalopissis' essential paraaminophenol with Clausen's diaminopyrazole, even if, as in *Winner*, such replacement is feasible. For at least this reason, the suggested modification fails to establish a *prima facie* case of obviousness.

FINNEGAN
HENDERSON
FARABOW
GARRETT &
DUNNER LLP

1300 I Street, NW
Washington, DC 20005
202.408.4000
Fax 202.408.4400
www.finnegan.com

Finally, Appellants respectfully submit that the motivation attributed to Clausen has been misstated, and that, when clarified, further demonstrates that the Examiner's proposed modification of Kalopissis based on Clausen fails to establish a prima facie case of obviousness. Specifically, the Examiner has argued, as motivation for the suggested modification, that "Clausen teaches that the claimed diaminopyrazoles are an improvement over p-aminophenol." Office Action of June 14, 2001, p. 3, line 19 to p. 4, line 3. More specifically, what Clausen teaches is that p-aminophenol is "criticized for not being physiologically tolerable" and that this problem is solved by use of formula (I) of Clausen. Clausen, col. 1, lines 43-65. Thus, rather than "at least **partially substitute** the p-aminophenol oxidation base of Kalopissis... with diaminopyrazole" (Office Action of June 14, 2001, p. 3, line 19 to p. 4, line 3 (emphasis added)), at best, the only logical modification and motivation based on Clausen is to **completely replace** the p-aminophenol oxidation base of Kalopissis with diaminopyrazole. Otherwise, if p-aminophenol is only *partially* substituted, the composition will, according to Clausen, still comprise the nonphysiologically tolerable p-aminophenol oxidation base. That is, the problem to which Clausen is directed (a physiologically tolerable composition), will not have been solved. However, as discussed previously, Kalopissis is not amenable to the removal of p-aminophenol, which is specifically disclosed as an essential feature of the Kalopissis compositions. *See* Kalopissis, col. 2, line 67 - col. 3, line 5.

Thus, Kalopissis teaches that p-aminophenol must be present, while Clausen teaches that it cannot be present. Given these irreconcilable teachings, there can be no motivation to make the proposed modification of Kalopissis in view of Clausen. Further, given their one hundred and eighty degree-opposite positions with respect to the

FINNEGAN
HENDERSON
FARABOW
GARRETT &
DUNNER LLP

1300 I Street, NW
Washington, DC 20005
202.408.4000
Fax 202.408.4400
www.finnegan.com

inclusion or exclusion of p-aminophenol, the only teaching from which the Examiner could possibly have based the proposed modification is Appellants' own disclosure. As the Board is aware, such hindsight reconstruction is wholly impermissible. See, *e.g.*, *In re Dembiczak*, 50 USPQ.2d 1614, 1617 (Fed. Cir. 1999). Accordingly, for at least this reason, the Examiner failed to establish a prima facie case of obviousness.

B. The Examiner's combination argument is in direct conflict with express teachings of references

In the final Office Action dated June 14, 2001, the Examiner newly argued a combination of Kalopissis and Clausen, as opposed to the previous substitution argument. Specifically, the Examiner cited to *In re Kerkhoven*, 205 USPQ 1069 (CCPA 1980), and argued that "it would also have been obvious to use the diaminopyrazole couplers in combination with the developers taught by Kalopissis." Office Action dated June 14, 2001, page 5 (emphasis added). Similarly, the Examiner argued that, with respect to "[Appellants'] argument that Kalopissis teaches away from the proposed combination, the examiner does not see where Kalopissis teaches away from adding known oxidation dyes bases to the composition." Advisory Action, page 2 (emphasis added). However, the Examiner's combination argument fails to establish a *prima facie* case for at least the reasons (1) that p-aminophenol is an essential feature of Kalopissis but Clausen teaches away from the use of p-aminophenol as not physiologically tolerable, and (2) there is no reasonable expectation of success for the proposed combination. Yes there is

FINNEGAN
HENDERSON
FARABOW
GARRETT &
DUNNER LLP

1300 I Street, NW
Washington, DC 20005
202.408.4000
Fax 202.408.4400
www.finnegan.com

(1) Clausen cannot be combined with Kalopissis's p-aminophenol, which Clausen identifies as not being physiologically tolerable.

As noted previously, Clausen teaches that p-aminophenol is "criticized for not being physiologically tolerable" and that this problem is solved by the alternative use of an oxidation base according to formula (I) of Clausen. Clausen, col. 1, lines 43-65. Thus Clausen (relied upon by the Examiner as a source of the motivation) expressly teaches away from the use of p-aminophenol. Clausen, therefore, teaches away from *combination* with Kalopissis's "not... physiologically tolerable" p-aminophenol compositions.

Accordingly, notwithstanding the Examiner's reliance on *In re Kerkhoven* as a short cut means to establishing a *prima facie* case of obviousness without first establishing the elements of a *prima facie* case as required by the Supreme Court in *Graham v. John Deere*, 383 U.S. 1, 148 USPQ 459 (1966), there is no motivation to mix compositions according to Kalopissis and Clausen since Clausen expressly teaches away from such a combination. For at least this reason, the Examiner failed to establish a prima facie case of obviousness.

(2) The art is unpredictable, and the Examiner has not established and the references do not provide a reasonable expectation of success for the proposed combination.

Even if Clausen did not expressly teach away from the proposed combination (though it does), the Examiner has not established and cannot establish the requisite reasonable expectation of success. Since *In re Kerkhoven* only applies to mere mixtures of compositions but the oxidation dyes of Clausen and Kalopissis are reactive compositions with unpredictable properties, the Examiner's reliance on *Kerkhoven* is misplaced and does not support the proposed combination.

FINNEGAN
HENDERSON
FARABOW
GARRETT &
DUNNER LLP

1300 I Street, NW
Washington, DC 20005
202.408.4000
Fax 202.408.4400
www.finnegan.com

First, although the Examiner cited *In re Kerkhoven* for the proposition that it is prima facie obvious to combine two compositions, the holding of *Kerkhoven* is not applicable to the combination suggested by the Examiner. Specifically, in *Kerkhoven* applicant claimed a process for preparing a detergent composition comprising **merely mixing** one anionic and one cationic detergent. *Kerkhoven*, 205 USPQ at 1070. In other words, the process formed a combination of detergent compositions. In *Kerkhoven,* the Office concluded that applicant's claims were obvious because they require no more than **mere mixing** to form a combination of two conventional detergents, each taught for the same purpose. *Id.* at 1071. The predecessor court to the Federal Circuit agreed, because the prior art contained the two conventional detergents which may be **merely mixed** to satisfy the claimed process. *Id.* at 1072.

In the present case, the facts are materially different, making application of the reasoning of *Kerkhoven* improper. While the claimed method in *Kerkhoven* **merely mixed** two detergents, the oxidation base and coupler compositions of Kalopissis and Clausen and combinations thereof are not mere static mixtures. Rather, as disclosed in Kalopissis (the primary reference), "[t]hese 'couplers' react in an oxidizing medium with the 'oxidation bases' to produce dyes which impart to the fibers or to living human hair a great variety of shades...." Kalopissis, col. 1, lines 26-30 (emphasis added). The properties of the resultant dyeing "depend[] upon the chemical structure of the two reactants." *Id.*

Likewise, as explained in C. Zviak, *The Science of Hair Care*, Marcel Dekker, Inc., New York, NY (1986)("Zviak"), bases and couplers react together in a polymerization reaction. See, for example, reactions (3) and (4), in which *m*-phenylene

FINNEGAN
HENDERSON
FARABOW
GARRETT &
DUNNER LLP

1300 I Street, NW
Washington, DC 20005
202.408.4000
Fax 202.408.4400
www.finnegan.com

diamine and resorcinol serve as couplers in the polymerization reaction. See Zviak, pages 269-271 (attached as Exhibit 1). The complexity of these compositions and their combinations is, qualitatively, entirely different from *Kerkhoven*'s pair of anionic and cationic detergents. However, the Examiner apparently failed to properly consider this complexity and reactivity when attempting to support the present rejection based on *Kerkhoven*. Regardless, since the suggested combination is a reactive composition and not a mere mixture, the Examiner's reliance on *Kerkhoven* is misplaced.

Second, in addition to not being similar to *Kerkhoven*'s mere mixtures, the Examiner did not establish and there does not exist a reasonable expectation of success for the proposed combination of Kalopissis and Clausen. It is well known that dye components can interact to unpredictably affect the properties of the composition, including its toxicity. Based on this unpredictability, there is no reasonable expectation of success.

For example, as evidence of the unpredictability in the art, Zviak explains that, with respect to the safety of finished products, "[a]ll finished cosmetic products must be evaluated for safety in use to make sure that they do not, under normal and foreseeable conditions, constitute a potential hazard for the consumer...." See Zviak, pages 329-330 (attached as Exhibit 2). Zviak further explains that such testing is not easily accomplished due to unpredictable component interactions. Specifically,

> [i]t might seem that a sensible way of proceeding would be to conduct most toxicological tests on the ingredients, which would reduce the amount of experimentation and cost of developing finished products. However, experience has shown that the formulation itself is the important element. It determines local tolerance after a single or repeated application, eye and/ or lung mucosa tolerance, the degree of absorption through the skin, etc.

FINNEGAN
HENDERSON
FARABOW
GARRETT &
DUNNER LLP

1300 I Street, NW
Washington, DC 20005
202.408.4000
Fax 202.408.4400
www.finnegan.com

Id. According to Zviak, synergistic effects that make a product more or less toxic may occur. That is, "[a]part from the effect of the vehicle, it has been observed that the association of different compounds can product either synergistic toxicity or, on the contrary, a mitigation or even inhibition of toxic effects." *Id.*

Likewise, as disclosed by specific examples in the present specification, the results upon the combination of dye components are unpredictable. For instance, as demonstrated in Examples 1-4 on pages 23 - 28 of the present application, color degradation (as measured by ΔE) can vary by more than 10x by merely changing one component of a nineteen component composition. See page 28, table.

Accordingly, given the unpredictability in the art, the Examiner failed to establish that one could reasonably expect that the proposed combination of Kalopissis and Clausen would result in a composition having the beneficial properties of either the primary or secondary references. In view of this unpredictability, the Examiner failed to show a reasonable expectation of success, and failed to establish a prima facie case of obviousness.

C. The alleged motivation relied upon by the Examiner is not specific to the proposed combination, and is insufficient to establish a *prima facie* case of obviousness.

The Examiner argued that "Clausen teaches that the such diaminopyrazoles are used to dye hair brilliant red shades when combined with conventional couplers...." Office Action of June 14, 2001, page 3, lines 15-18. However, the Examiner misstated the disclosure of Clausen, and ignored Clausen's express teachings of appropriate couplers that are chemically distinct from those of Kalopissis. The Examiner's actual

FINNEGAN
HENDERSON
FARABOW
GARRETT &
DUNNER LLP

1300 I Street, NW
Washington, DC 20005
202.408.4000
Fax 202.408.4400
www.finnegan.com

proposed combination/modification is not supported by the requisite substantial evidence found in the record.

First, the alleged motivation is based on a mischaracterization of Clausen. While Clausen does make references to "conventional couplers," Clausen does not state that the diaminopyrazols disclosed therein may be used with "conventional couplers." Rather, Clausen identifies the problem

> of providing an oxidation hair dye composition based on a combination of developer substances and coupler substances containing a developer substance for the red area which is very favorably tolerated physiologically and, together with conventional coupler substances, dyes the hair in brilliant red color shades with a great depth of color.

Clausen, col. 1, lines 55-62. This identification of a problem does not include any statement that Clausen's diaminopyrazol can be used with "conventional couplers."

Second, even if Clausen did suggest the use of diaminopyrazol with "conventional couplers," the Examiner has provided no evidence that the "conventional couplers" of Clausen include the halogenated and aminated phenols according to Kalopissis. Absent such evidence, the Examiner's argument lacks the requisite motivation to establish *prima facie* obviousness.

More specifically, the Examiner has provided no evidence that the "conventional couplers" of Clausen include the coupler 2-chloro-5-aminophenol coupler in Kalopissis' Examples 22 and 27 or the 2-bromo-5-aminophenol (Example 32), examples which were singled out by the Examiner in the rejection. In fact, while Clausen states that "the proposed problem is solved in an outstanding manner," (Clausen, col. 1, lines 63-64) all the couplers actually suggested for use by Clausen are chemically distinct from those of Kalopissis.

FINNEGAN
HENDERSON
FARABOW
GARRETT &
DUNNER LLP

1300 I Street, NW
Washington, DC 20005
202.408.4000
Fax 202.408.4400
www.finnegan.com

Specifically, the disclosure of Clausen clearly teaches that the compositions disclosed therein solve problems of the prior art "in an outstanding manner" based on a preferred group of couplers. Clausen, col. 1, line 64; col. 2, lines 30-44. The couplers identified in Clausen have the following common features:

(1) not one of couplers has both amine and halogen functional groups,

(2) not one of the couplers has both amine and halogen functional groups on a phenol species, and

(3) not one of the couplers has both amine and halogen functional groups on a phenol species, where the amine group is meta relative to the hydroxy group.

See Clausen, col. 2, lines 30-44. These distinguishing features clearly differentiate Clausen's couplers from those according to Kalopissis.

Thus, since Clausen clearly teaches that "outstanding" results can be obtained using a preferred selection of couplers (none of which are within the scope of the couplers according to Kalopissis), Clausen clearly lacks any motivation to use diaminopyrazol bases with couplers according to Kalopissis. Contrary to the Examiner's assertions, Clausen does not teach or suggest that their diaminopyrazols can be used with all couplers, and certainly does not teach or suggest that suitable "conventional couplers" include the 2-amino-5-halophenols of Kalopissis.

Further, since the references do not support the specific motivation to combine Clausen's diaminopyrazols oxidation bases with Kalopissis' 2-amino-5-halophenol couplers, the Examiner's alleged motivation fails to meet the Federal Circuit's

FINNEGAN
HENDERSON
FARABOW
GARRETT &
DUNNER LLP

1300 I Street, NW
Washington, DC 20005
202.408.4000
Fax 202.408.4400
www.finnegan.com

requirement that the record contain "substantial evidence" to support the Office's determinations of *prima facie* obviousness. *See In re Zurko*, 258 F.3d 1379, 1386 (Fed. Cir. 2001). Specifically, unless "substantial evidence" found in the record supports the factual determinations central to the issue of patentability, the rejection is improper and should be withdrawn. *See Zurko*, 258 F.3d at 1386. In *Zurko*, the Federal Circuit explicitly required "concrete evidence in the record in support of these [core factual] findings" in a determination of patentability. *Id.* at 1386. Such concrete evidence in support of the use of Clausen's diaminopyrazol bases with Kalopissis' 2-amino-5-halophenol couplers is absent from the Examiner's argument, and is absent from the record.

On January 18, 2002, the Federal Circuit again reaffirmed the Examiner's high burden to establish a *prima facie* case of obviousness and emphasized the requirement for specificity. In *In re Sang-Su Lee*, the Federal Circuit held that "[t]he factual inquiry whether to combine references must be thorough and searching. It must be based on objective evidence of record. This precedent has been reinforced in myriad decisions, and cannot be dispensed with." No. 00-1158, slip. op. at 7 (Fed. Cir. Jan. 18, 2002) (internal quotations and citations omitted). Further, the Federal Circuit explained that

> [t]he need for specificity pervades this authority... the examiner can satisfy the burden of showing obviousness of the combination only by showing some objective teaching in the prior art or that knowledge generally available to one of ordinary skill in the art would lead that individual to combine the relevant teachings of the references.

Id. at 8 (internal citations and quotation omitted)(emphasis added).

However, the Examiner's rejection is based on a mis-cited reference to "conventional couplers" in Clausen that lacks the required specificity for the particular

FINNEGAN
HENDERSON
FARABOW
GARRETT &
DUNNER LLP

1300 I Street, NW
Washington, DC 20005
202.408.4000
Fax 202.408.4400
www.finnegan.com

combination of Clausen's diaminopyrazol base with Kalopissis's 2-amino-5-halophenol coupler, and is not supported by any objective evidence found in the record.

Accordingly, the Examiner failed to establish a prima facie case of obviousness.

IX. Conclusion

For the reasons set forth above, Appellants maintain that a *prima facie* case of obviousness has not been established by the Examiner based on the cited references, taken alone or in combination. The Examiner failed to demonstrate that one of ordinary skill in the art would have been motivated to make or have reasonable expectation of success for the modification or combination proposed by the Examiner. Accordingly, Appellants respectfully request reversal of the rejections of claims 20-47 under 35 U.S.C. § 103(a).

FINNEGAN
HENDERSON
FARABOW
GARRETT &
DUNNER LLP

1300 I Street, NW
Washington, DC 20005
202.408.4000
Fax 202.408.4400
www.finnegan.com

To the extent any further extension of time under 37 C.F.R. § 1.136 is required to obtain entry of this Appeal Brief, such extension is hereby respectfully requested. If there are any fees due under 37 C.F.R. §§ 1.16 or 1.17 which are not enclosed herewith, including any fees required for an extension of time under 37 C.F.R. § 1.136, please charge such fees to our Deposit Account No. 06-0916.

Respectfully submitted,

FINNEGAN, HENDERSON, FARABOW, GARRETT & DUNNER, L.L.P.

Dated: February 14, 2002

By: _____
Mark J. Feldstein
Reg. No. 46,693

Post Office Address (to which correspondence is to be sent)

Finnegan, Henderson, Farabow, Garrett & Dunner, L.L.P.
1300 I Street, N.W.
Washington, D.C. 20005
(202) 408-4000

Exhibits:

1. C. Zviak, *The Science of Hair Care*, Marcel Dekker, Inc., New York, NY, 269-271 (1986).
2. C. Zviak, *The Science of Hair Care*, Marcel Dekker, Inc., New York, NY, 329-330 (1986).

FINNEGAN
HENDERSON
FARABOW
GARRETT &
DUNNER LLP

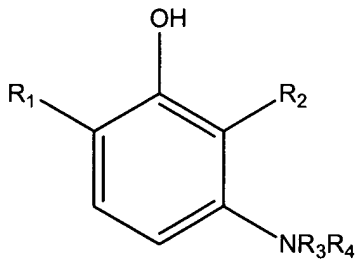
1300 I Street, NW
Washington, DC 20005
202.408.4000
Fax 202.408.4400
www.finnegan.com

APPENDIX - PENDING CLAIMS

20. A composition for the oxidation dyeing of keratin fibers comprising:

- at least one oxidation base chosen from diaminopyrazoles, triaminopyrazoles, and acid-addition salts thereof;

- and at least one coupler chosen from halogenated meta-aminophenols of formula (I), and acid addition salts thereof:



(I)

in which:

- R_1 and R_2, which are identical or different, are chosen from a hydrogen atom, a halogen atom, a C_1-C_4 alkyl radical, a C_1-C_4 monohydroxyalkyl radical, a C_2-C_4 polyhydroxyalkyl radical, a C_1-C_4 alkoxy radical, a C_1-C_4 monohydroxyalkoxy radical and a C_2-C_4 polyhydroxyalkoxy radical;

- R_3 and R_4, which are identical or different, are chosen from a hydrogen atom, a C_1-C_4 alkyl radical, a C_1-C_4 monohydroxyalkyl radical, a C_2-C_4 polyhydroxyalkyl radical and a C_1-C_4 monoaminoalkyl radical;

with the proviso that at least one of said radicals R_1 and R_2 is a halogen atom.

21. A composition according to Claim 20, wherein said keratin fibers are human keratin fibers.

22. A composition according to Claim 21, wherein said human keratin fibers are human hair.

FINNEGAN
HENDERSON
FARABOW
GARRETT &
DUNNER LLP

1300 I Street, NW
Washington, DC 20005
202.408.4000
Fax 202.408.4400
www.finnegan.com

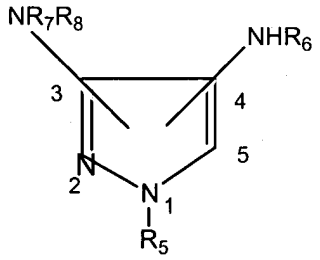
23. A composition according to Claim 20, wherein said composition is in a medium suitable for dyeing.

24. A composition according to Claim 20, wherein said halogen atoms are chosen from chlorine, bromine, iodine and fluorine.

25. A composition according to Claim 20, wherein said halogenated meta-aminophenols of formula (I) are chosen from 3-amino-6-chlorophenol, 3-amino-6-bromophenol, 3-(β-aminoethyl)amino-6-chlorophenol, 3-(β-hydroxyethyl)amino-6-chlorophenol and 3-amino-2-chloro-6-methylphenol, and acid addition salts thereof.

26. A composition according to Claim 20, wherein said diaminopyrazoles are chosen from:

a) diaminopyrazoles of formula (II), and acid addition salts thereof:



(II)

in which:

- R_5 is chosen from a hydrogen atom, a C_1-C_6 alkyl radical, a C_2-C_4 hydroxyalkyl radical, a benzyl radical, a phenyl radical, a benzyl radical substituted with a halogen atom, a C_1-C_4 alkyl radical or C_1-C_4 alkoxy radical, or

R_5 forms, with the nitrogen atom of the group NR_7R_8 in position 5, a hexahydropyridazine or tetrahydropyrazole heterocycle which is optionally monosubstituted with a C_1-C_4 alkyl group;

FINNEGAN
HENDERSON
FARABOW
GARRETT &
DUNNER LLP

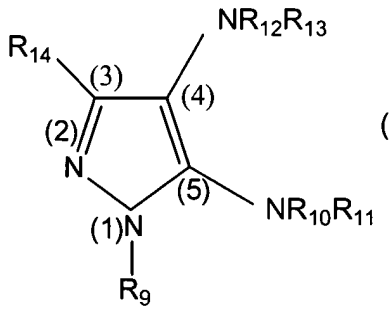
1300 I Street, NW
Washington, DC 20005
202.408.4000
Fax 202.408.4400
www.finnegan.com

- R_6 and R_7 which are identical or different, are chosen from a hydrogen atom, a C_1-C_4 alkyl radical, a C_2-C_4 hydroxyalkyl radical, a benzyl radical and a phenyl radical;

- R_8 is chosen from a hydrogen atom, a C_1-C_6 alkyl radical and a C_2-C_4 hydroxyalkyl radical;

with the proviso that R_6 is a hydrogen atom when R_5 either is a substituted benzyl radical or forms a heterocycle with the nitrogen atom of the group NR_7R_8 in position 5; and

b) diaminopyrazoles of formula (III), and acid addition salts thereof:



(III)

in which:

- R_9, R_{10}, R_{11}, R_{12} and R_{13}, which are identical or different, are chosen from a hydrogen atom; a linear or branched C_1-C_6 alkyl radical; a C_2-C_4 hydroxyalkyl radical; a C_2-C_4 aminoalkyl radical; a phenyl radical; a phenyl radical substituted with a halogen atom or a C_1-C_4 alkyl, C_1-C_4 alkoxy, nitro, trifluoromethyl, amino or C_1-C_4 alkylamino radical; a benzyl radical; a benzyl radical substituted with a halogen atom or with a C_1-C_4 alkyl, C_1-C_4 alkoxy, methylenedioxy or amino radical; and a radical

$$—(CH_2)_m—X—\underset{\displaystyle Y}{(CH)_n}—Z$$

in which m and n are integers, which are identical or different, ranging from 1 to 3 inclusive, X is chosen from an oxygen atom and an NH group, Y is chosen from a

FINNEGAN
HENDERSON
FARABOW
GARRETT &
DUNNER LLP

1300 I Street, NW
Washington, DC 20005
202.408.4000
Fax 202.408.4400
www.finnegan.com

hydrogen atom and a methyl radical, and Z is chosen from a methyl radical and a group OR or NRR' in which R and R', which are identical or different, are chosen from a hydrogen atom, a methyl radical and an ethyl radical,

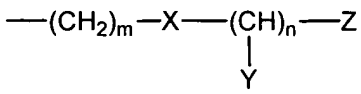
with the proviso that when R_{10} is a hydrogen atom, then R_{11} can also be an amino or C_1-C_4 alkylamino radical,

- R_{14} is chosen from a linear or branched C_1-C_6 alkyl radical; a C_1-C_4 hydroxyalkyl radical; a C_1-C_4 aminoalkyl radical; a (C_1-C_4)alkylamino(C_1-C_4)alkyl radical; a di(C_1-C_4)alkylamino(C_1-C_4)alkyl radical; a hydroxy(C_1-C_4)alkylamino(C_1-C_4)alkyl radical; a (C_1-C_4)alkoxymethyl radical; a phenyl radical; a phenyl radical substituted with a halogen atom or with a C_1-C_4 alkyl, C_1-C_4 alkoxy, nitro, trifluoromethyl, amino or C_1-C_4 alkylamino radical; a benzyl radical; a benzyl radical substituted with a halogen atom or with a C_1-C_4 alkyl, C_1-C_4 alkoxy, nitro, trifluoromethyl, amino or C_1-C_4 alkylamino radical; a heterocycle chosen from thiophene, furan and pyridine; and a radical -$(CH_2)_p$-O-$(CH_2)_q$-OR", in which p and q are integers, which are identical or different, ranging from 1 to 3 inclusive, and R" is chosen from a hydrogen atom and a methyl radical;

with the provisos that, in formula (III),

- at least one of the radicals R_{10}, R_{11}, R_{12} and R_{13} is a hydrogen atom;

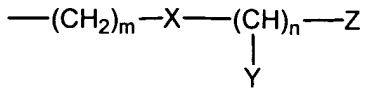
- when R_{10}, or R_{12}, respectively, is a substituted or unsubstituted phenyl radical, or a benzyl radical or a radical



then R_{11}, or R_{13}, respectively, is not a substituted or unsubstituted phenyl radical, or a benzyl radical or a radical

FINNEGAN
HENDERSON
FARABOW
GARRETT &
DUNNER LLP

1300 I Street, NW
Washington, DC 20005
202.408.4000
Fax 202.408.4400
www.finnegan.com

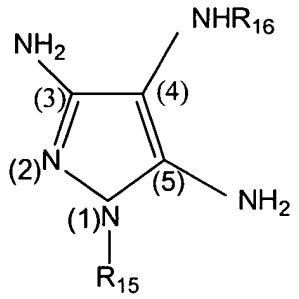


;

- when R_{12} and R_{13} simultaneously represent a hydrogen atom, then R_9 can form, with R_{10} and R_{11}, a hexahydropyrimidine or tetrahydroimidazole heterocycle which is optionally substituted with a C_1-C_4 alkyl or 1,2,4-tetrazole radical;

- when R_{10}, R_{11}, R_{12} and R_{13} represent a hydrogen atom or a C_1-C_6 alkyl radical, then R_9 or R_{14} can also represent a 2-, 3- or 4-pyridyl, 2- or 3-thienyl or 2- or 3-furyl heterocyclic residue which is optionally substituted with a methyl radical or a cyclohexyl radical.

27. A composition according to Claim 20, wherein said triaminopyrazoles are chosen from compounds of formula (IV), and acid addition salts thereof:



(IV)

in which:

- R_{15} and R_{16}, which are identical or different, are chosen from a hydrogen atom, a C_1-C_4 alkyl and a C_2-C_4 hydroxyalkyl radical.

28. A composition according to Claim 26, wherein said diaminopyrazoles of formula (II) are chosen from:

- 4,5-diamino-1-(4'-methoxybenzyl)pyrazole,

- 4,5-diamino-1-(4'-methylbenzyl)pyrazole,

- 4,5-diamino-1-(4'-chlorobenzyl)pyrazole,

- 4,5-diamino-1-(3'-methoxybenzyl)pyrazole,

FINNEGAN
HENDERSON
FARABOW
GARRETT &
DUNNER LLP

1300 I Street, NW
Washington, DC 20005
202.408.4000
Fax 202.408.4400
www.finnegan.com

- 4-amino-1-(4'-methoxybenzyl)-5-methylaminopyrazole,

- 4-amino-5-(β-hydroxyethyl)amino-1-(4'-methoxybenzyl)pyrazole,

- 4-amino-5-(β-hydroxyethyl)amino-1-methylpyrazole,

- 4-amino-(3)5-methylaminopyrazole,

- 3-(5)4-diaminopyrazole,

- 4,5-diamino-1-methylpyrazole,

- 4,5-diamino-1-benzylpyrazole,

- 3-amino-4,5,7,8-tetrahydropyrazolo{1,5-a}pyrimidine,

- 7-amino-2,3-dihydro-1H-imidazolo{1,2-b}pyrazole,

- 3-amino-8-methyl-4,5,7,8-tetrahydropyrazolo{1,5-a}pyrimidine,

and acid addition salts thereof.

29. A composition according to Claim 26, wherein said diaminopyrazoles of formula (III) are chosen from:

- 1-benzyl-4,5-diamino-3-methylpyrazole,

- 4,5-diamino-1-(β-hydroxyethyl)-3-(4'-methoxyphenyl)pyrazole,

- 4,5-diamino-1-(β-hydroxyethyl)-3-(4'-methylphenyl)pyrazole,

- 4,5-diamino-1-(β-hydroxyethyl)-3-(3'-methylphenyl)pyrazole,

- 4,5-diamino-3-methyl-1-isopropylpyrazole,

- 4,5-diamino-3-(4'-methoxyphenyl)-1-isopropylpyrazole,

- 4,5-diamino-1-ethyl-3-methylpyrazole,

- 4,5-diamino-1-ethyl-3-(4'-methoxyphenyl)pyrazole,

- 4,5-diamino-3-hydroxymethyl-1-methylpyrazole,

- 4,5-diamino-1-ethyl-3-hydroxymethylpyrazole,

FINNEGAN
HENDERSON
FARABOW
GARRETT &
DUNNER LLP

1300 I Street, NW
Washington, DC 20005
202.408.4000
Fax 202.408.4400
www.finnegan.com

- 4,5-diamino-3-hydroxymethyl-1-isopropylpyrazole,
- 4,5-diamino-3-hydroxymethyl-1-tert-butylpyrazole,
- 4,5-diamino-3-hydroxymethyl-1-phenylpyrazole,
- 4,5-diamino-3-hydroxymethyl-1-(2'-methoxyphenyl)pyrazole,
- 4,5-diamino-3-hydroxymethyl-1-(3'-methoxyphenyl)pyrazole,
- 4,5-diamino-3-hydroxymethyl-1-(4'-methoxyphenyl)pyrazole,
- 1-benzyl-4,5-diamino-3-hydroxymethylpyrazole,
- 4,5-diamino-3-methyl-1-(2'-methoxyphenyl)pyrazole,
- 4,5-diamino-3-methyl-1-(3'-methoxyphenyl)pyrazole,
- 4,5-diamino-3-methyl-1-(4'-methoxyphenyl)pyrazole,
- 3-aminomethyl-4,5-diamino-1-methylpyrazole,
- 3-aminomethyl-4,5-diamino-1-ethylpyrazole,
- 3-aminomethyl-4,5-diamino-1-isopropylpyrazole,
- 3-aminomethyl-4,5-diamino-1-tert-butylpyrazole,
- 4,5-diamino-3-dimethylaminomethyl-1-methylpyrazole,
- 4,5-diamino-3-dimethylaminomethyl-1-isopropylpyrazole,
- 4,5-diamino-3-dimethylaminomethyl-1-tert-butylpyrazole,
- 4,5-diamino-3-ethylaminomethyl-1-methylpyrazole,
- 4,5-diamino-3-ethylaminomethyl-1-ethylpyrazole,
- 4,5-diamino-3-ethylaminomethyl-1-isopropylpyrazole,
- 4,5-diamino-3-ethylaminomethyl-1-tert-butylpyrazole,
- 4,5-diamino-3-methylaminomethyl-1-methylpyrazole,
- 4,5-diamino-3-methylaminomethyl-1-isopropylpyrazole,

FINNEGAN
HENDERSON
FARABOW
GARRETT &
DUNNER LLP

1300 I Street, NW
Washington, DC 20005
202.408.4000
Fax 202.408.4400
www.finnegan.com

- 4,5-diamino-1-ethyl-3-methylaminomethylpyrazole,
- 1-tert-butyl-4,5-diamino-3-methylaminomethylpyrazole,
- 4,5-diamino-3-{(β-hydroxyethyl)aminomethyl}-1-methylpyrazole,
- 4,5-diamino-3-{(β-hydroxyethyl)aminomethyl}-1-isopropylpyrazole,
- 4,5-diamino-1-ethyl-3-{(β-hydroxyethyl)aminomethyl}pyrazole,
- 1-tert-butyl-4,5-diamino-3-{(β-hydroxyethyl)aminomethyl}pyrazole,
- 4-amino-5-(β-hydroxyethyl)amino-1,3-dimethylpyrazole,
- 4-amino-5-(β-hydroxyethyl)amino-1-isopropyl-3-methylpyrazole,
- 4-amino-5-(β-hydroxyethyl)amino-1-ethyl-3-methylpyrazole,
- 4-amino-5-(β-hydroxyethyl)amino-1-tert-butyl-3-methylpyrazole,
- 4-amino-5-(β-hydroxyethyl)amino-1-phenyl-3-methylpyrazole,
- 4-amino-5-(β-hydroxyethyl)amino-1-(2-methoxyphenyl)-3-methylpyrazole,
- 4-amino-5-(β-hydroxyethyl)amino-1-(3-methoxyphenyl)-3-methylpyrazole,
- 4-amino-5-(β-hydroxyethyl)amino-1-(4-methoxyphenyl)-3-methylpyrazole,
- 4-amino-5-(β-hydroxyethyl)amino-1-benzyl-3-methylpyrazole,
- 4-amino-1-ethyl-3-methyl-5-methylaminopyrazole,
- 4-amino-1-tert-butyl-3-methyl-5-methylaminopyrazole,
- 4,5-diamino-1,3-dimethylpyrazole,
- 4,5-diamino-3-tert-butyl-1-methylpyrazole,
- 4,5-diamino-1-tert-butyl-3-methylpyrazole,
- 4,5-diamino-1-methyl-3-phenylpyrazole,
- 4,5-diamino-1-(β-hydroxyethyl)-3-methylpyrazole,
- 4,5-diamino-1-(β-hydroxyethyl)-3-phenylpyrazole,

FINNEGAN
HENDERSON
FARABOW
GARRETT &
DUNNER LLP

1300 I Street, NW
Washington, DC 20005
202.408.4000
Fax 202.408.4400
www.finnegan.com

- 4,5-diamino-1-methyl-3-(2'-chlorophenyl)pyrazole,

- 4,5-diamino-1-methyl-3-(4'-chlorophenyl)pyrazole,

- 4,5-diamino-1-methyl-3-(3'-trifluoromethylphenyl)pyrazole,

- 4,5-diamino-1,3-diphenylpyrazole,

- 4,5-diamino-3-methyl-1-phenylpyrazole,

- 4-amino-1,3-dimethyl-5-phenylaminopyrazole,

- 4-amino-1-ethyl-3-methyl-5-phenylaminopyrazole,

- 4-amino-1,3-dimethyl-5-methylaminopyrazole,

- 4-amino-3-methyl-1-isopropyl-5-methylaminopyrazole,

- 4-amino-3-isobutoxymethyl-1-methyl-5-methylaminopyrazole,

- 4-amino-3-methoxyethoxymethyl-1-methyl-5-methylaminopyrazole,

- 4-amino-3-hydroxymethyl-1-methyl-5-methylaminopyrazole,

- 4-amino-1,3-diphenyl-5-phenylaminopyrazole,

- 4-amino-3-methyl-5-methylamino-1-phenylpyrazole,

- 4-amino-1,3-dimethyl-5-hydrazinopyrazole,

- 5-amino-3-methyl-4-methylamino-1-phenylpyrazole,

- 5-amino-1-methyl-4-(N,N-methylphenyl)amino-3-(4'-chlorophenyl)pyrazole,

- 5-amino-3-ethyl-1-methyl-4-(N,N-methylphenyl)aminopyrazole,

- 5-amino-1-methyl-4-(N,N-methylphenyl)amino-3-phenylpyrazole,

- 5-amino-3-ethyl-4-(N,N-methylphenyl)aminopyrazole,

- 5-amino-4-(N,N-methylphenyl)amino-3-phenylpyrazole,

- 5-amino-4-(N,N-methylphenyl)amino-3-(4'-methylphenyl)pyrazole,

- 5-amino-3-(4'-chlorophenyl)-4-(N,N-methylphenyl)aminopyrazole,

FINNEGAN
HENDERSON
FARABOW
GARRETT &
DUNNER LLP

1300 I Street, NW
Washington, DC 20005
202.408.4000
Fax 202.408.4400
www.finnegan.com

- 5-amino-3-(4'-methoxyphenyl)-4-(N,N-methylphenyl)aminopyrazole,

- 4-amino-5-methylamino-3-phenylpyrazole,

- 4-amino-5-ethylamino-3-phenylpyrazole,

- 4-amino-5-ethylamino-3-(4'-methylphenyl)pyrazole,

- 4-amino-3-phenyl-5-propylaminopyrazole,

- 4-amino-5-butylamino-3-phenylpyrazole,

- 4-amino-3-phenyl-5-phenylaminopyrazole,

- 4-amino-5-benzylamino-3-phenylpyrazole,

- 4-amino-5-(4'-chlorophenyl)amino-3-phenylpyrazole,

- 4-amino-3-(4'-chlorophenyl)-5-phenylaminopyrazole,

- 4-amino-3-(4'-methoxyphenyl)-5-phenylaminopyrazole,

- 1-(4'-chlorobenzyl)-4,5-diamino-3-methylpyrazole,

- 4,5-diamino-3-hydroxymethyl-1-isopropylpyrazole,

- 4-amino-1-ethyl-3-methyl-5-methylaminopyrazole,

- 4-amino-5-(2'-aminoethyl)amino-1,3-dimethylpyrazole,

and acid addition salts thereof.

30. A composition according to Claim 29, wherein said diaminopyrazoles of formula (III) are chosen from:

- 4,5-diamino-1,3-dimethylpyrazole,

- 4,5-diamino-3-methyl-1-phenylpyrazole,

- 4,5-diamino-1-methyl-3-phenylpyrazole,

- 4-amino-1,3-dimethyl-5-hydrazinopyrazole,

- 1-benzyl-4,5-diamino-3-methylpyrazole,

FINNEGAN
HENDERSON
FARABOW
GARRETT &
DUNNER LLP

1300 I Street, NW
Washington, DC 20005
202.408.4000
Fax 202.408.4400
www.finnegan.com

- 4,5-diamino-3-tert-butyl-1-methylpyrazole,

- 4,5-diamino-1-tert-butyl-3-methylpyrazole,

- 4,5-diamino-1-(β-hydroxyethyl)-3-methylpyrazole,

- 4,5-diamino-1-ethyl-3-methylpyrazole,

- 4,5-diamino-1-ethyl-3-(4'-methoxyphenyl)pyrazole,

- 4,5-diamino-1-ethyl-3-hydroxymethylpyrazole,

- 4,5-diamino-3-hydroxymethyl-1-methylpyrazole,

- 4,5-diamino-3-hydroxymethyl-1-isopropylpyrazole,

- 4,5-diamino-3-methyl-1-isopropylpyrazole,

- 4-amino-5-(2'-aminoethyl)amino-1,3-dimethylpyrazole,

and acid addition salts thereof.

31. A composition according to Claim 27 wherein said triaminopyrazoles of formula (IV) are chosen from 3,4,5-triaminopyrazole, 1-methyl-3,4,5-triaminopyrazole, 3,5-diamino-1-methyl-4-methylaminopyrazole and 3,5-diamino-4-(β-hydroxyethyl)amino-1-methylpyrazole, and acid addition salts thereof.

32. A composition according to Claim 20, wherein said at least one oxidation base is present in an amount ranging from 0.0005 to 12% by weight relative to the total weight of the composition.

33. A composition according to Claim 32, wherein said at least one oxidation base is present in an amount ranging from 0.005 to 6% by weight relative to the total weight of the composition.

FINNEGAN
HENDERSON
FARABOW
GARRETT &
DUNNER LLP

1300 I Street, NW
Washington, DC 20005
202.408.4000
Fax 202.408.4400
www.finnegan.com

34. A composition according to Claim 20, wherein said at least one coupler is present in an amount ranging from 0.0001 to 5% by weight relative to the total weight of the composition.

35. A composition according to Claim 34, wherein said at least one coupler is present in an amount ranging from 0.005 to 3% by weight relative to the total weight of the composition.

36. A composition according to Claim 20, wherein said acid addition salts are chosen from hydrochlorides, hydrobromides, sulphates, tartrates, lactates and acetates.

37. A composition according to Claim 23, wherein said medium suitable for dyeing or support comprises water or a mixture of water and at least one organic solvent.

38. A composition according to Claim 37, wherein said at least one organic solvent is chosen from C_1-C_4 lower alkanols, glycerol, glycols and glycol ethers, and aromatic alcohols.

39. A composition according to Claim 20, wherein said composition has a pH ranging from 3 to 12.

40. A composition according to Claim 20, wherein said composition is in the form of a liquid, a cream, or a gel.

41. A composition according to Claim 40, wherein said composition is in the form of a liquid, a cream, a gel, or in any other form suitable for dyeing human hair.

42. A method for dyeing keratin fibers, comprising:

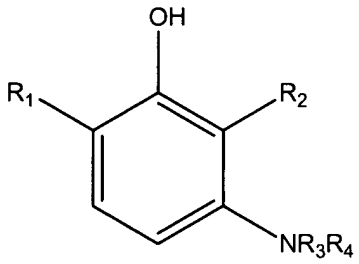
(a) applying to said keratin fibers at least one dye composition, which comprises

FINNEGAN
HENDERSON
FARABOW
GARRETT &
DUNNER LLP

1300 I Street, NW
Washington, DC 20005
202.408.4000
Fax 202.408.4400
www.finnegan.com

- at least one oxidation base chosen from diaminopyrazoles, triaminopyrazoles, and acid-addition salts thereof;

- and at least one coupler chosen from halogenated meta-aminophenols of formula (I), and acid addition salts thereof:



(I)

in which:

- R_1 and R_2, which are identical or different, are chosen from a hydrogen atom, a halogen atom, a C_1-C_4 alkyl radical, a C_1-C_4 monohydroxyalkyl radical, a C_2-C_4 polyhydroxyalkyl radical, a C_1-C_4 alkoxy radical, a C_1-C_4 monohydroxyalkoxy radical and a C_2-C_4 polyhydroxyalkoxy radical;

- R_3 and R_4, which are identical or different, are chosen from a hydrogen atom, a C_1-C_4 alkyl radical, a C_1-C_4 monohydroxyalkyl radical, a C_2-C_4 polyhydroxyalkyl radical and a C_1-C_4 monoaminoalkyl radical;

with the proviso that at least one of said radicals R_1 and R_2 is a halogen atom;

and

(b) developing a color at an acidic, neutral or alkaline pH with the aid of an oxidizing agent, wherein said oxidizing agent is added to said at least one dye composition at the time of application of said composition, or wherein said oxidizing agent is present in an oxidizing composition, and wherein said oxidizing composition is applied simultaneously or sequentially with said at least one dye composition.

FINNEGAN
HENDERSON
FARABOW
GARRETT &
DUNNER LLP

1300 I Street, NW
Washington, DC 20005
202.408.4000
Fax 202.408.4400
www.finnegan.com

43. A method according to Claim 42, wherein said keratin fibers are human keratin fibers.

44. A method according to Claim 43, wherein said human keratin fibers are human hair.

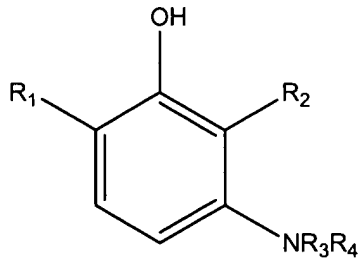
45. A method according to Claim 42, wherein said oxidizing agent is chosen from hydrogen peroxide, urea peroxide, alkali metal bromates, persalts, and peracids.

46. A method according to Claim 45, wherein said persalts are chosen from perborates, percarbonates and persulphates.

47. A multi-compartment kit for dyeing keratin fibers, comprising at least two compartments, wherein one compartment comprises an oxidizing composition, and another compartment comprises a composition for the oxidation dyeing of keratin fibers, said composition for the oxidation dyeing of keratin fibers comprising:

- at least one oxidation base chosen from diaminopyrazoles, triaminopyrazoles, and acid-addition salts thereof;

- and at least one coupler chosen from halogenated meta-aminophenols of formula (I), and acid addition salts thereof:



(I)

in which:

- R_1 and R_2, which are identical or different, are chosen from a hydrogen atom, a halogen atom, a C_1-C_4 alkyl radical, a C_1-C_4 monohydroxyalkyl radical, a C_2-C_4

FINNEGAN
HENDERSON
FARABOW
GARRETT &
DUNNER LLP

1300 I Street, NW
Washington, DC 20005
202.408.4000
Fax 202.408.4400
www.finnegan.com

polyhydroxyalkyl radical, a C_1-C_4 alkoxy radical, a C_1-C_4 monohydroxyalkoxy radical and a C_2-C_4 polyhydroxyalkoxy radical;

- R_3 and R_4, which are identical or different, are chosen from a hydrogen atom, a C_1-C_4 alkyl radical, a C_1-C_4 monohydroxyalkyl radical, a C_2-C_4 polyhydroxyalkyl radical and a C_1-C_4 monoaminoalkyl radical;

with the proviso that at least one of said radicals R_1 and R_2 is a halogen atom.

FINNEGAN
HENDERSON
FARABOW
GARRETT &
DUNNER LLP

1300 I Street, NW
Washington, DC 20005
202.408.4000
Fax 202.408.4400
www.finnegan.com

tain shades with reddish highlights (coppery,
dyes are added to the oxidation dyes. They
riphenylmethane classes, in so far as they
rally, aromatic nitro derivatives are used,
he amine or diamine class or the phenol or
sidered as oxidation dyes. They do not
elf or in the oxidative condensations. Their
de the highlight.

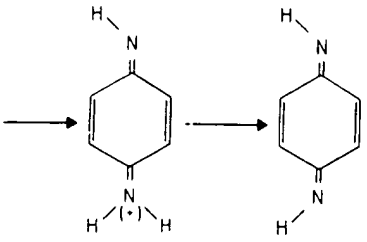
ANISMS

of the precursors defined above (*base* or
polymerization, produce a pigment that will

idation of *p*-phenylenediamine yields the
that oxidation of *p*-aminophenol generates
ion occurs in the presence of phenols or
tituted on the ring by halogen atoms or CH_3
providing the *para* position to the phenol
ndense on these compounds, resulting in the
the quinone monoimine, there is formation

n be described without too much difficulty
on its own or of binary *base-coupler* mixes.
hanism of oxidative copolymerization once
s present, which is a common occurrence in

describe the condensation of *p*-phenylene-
ouplings of *p*-phenylenediamine with *m*-
pectively.



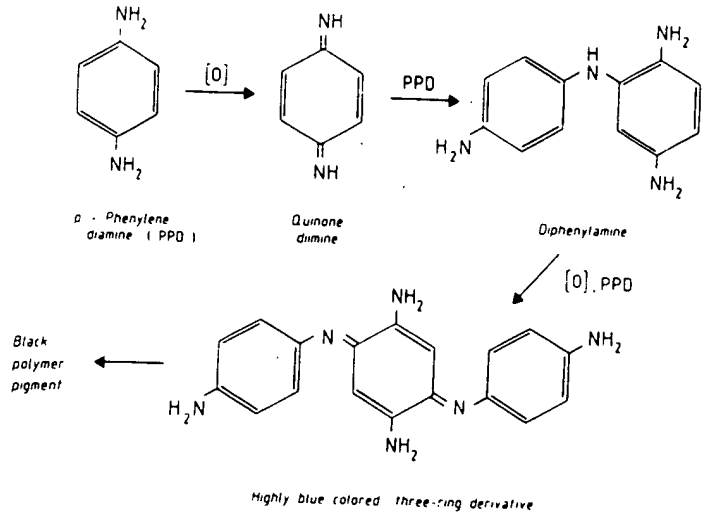
(I) (II)

The first step [Eq.(1)] involves oxidation of PPD to quinone diimine [Eq.(1)II], an active intermediate that readily reacts with a nucleophilic, *i.e.*, electron-rich, compound such as the couplers mentioned (Table 2), or much less readily with PPD itself or other *para*-dyes. The active intermediate may be not the quinone diimine itself, but the quinone diiminium ion [Eq.(1)I] which is produced at a stage before quinone diimine, in the stepwise alkaline oxidative sequence starting from PPD. A number of reviews deal with the possible mechanisms involved (see references).

The chemical reactions [Eqs.(2)–(4)] are represented with quinonediimine as active intermediate.

A. Oxidation of *p*-Phenylenediamine

Quinone diimine (II) reacts with PPD to form diphenylamine, which in turn may undergo successive oxidation and condensation on PPD to produce a deep-blue colored three-ring derivative. The chain reaction then proceeds toward the formation of a black polymer pigment whose structure is not completely established.



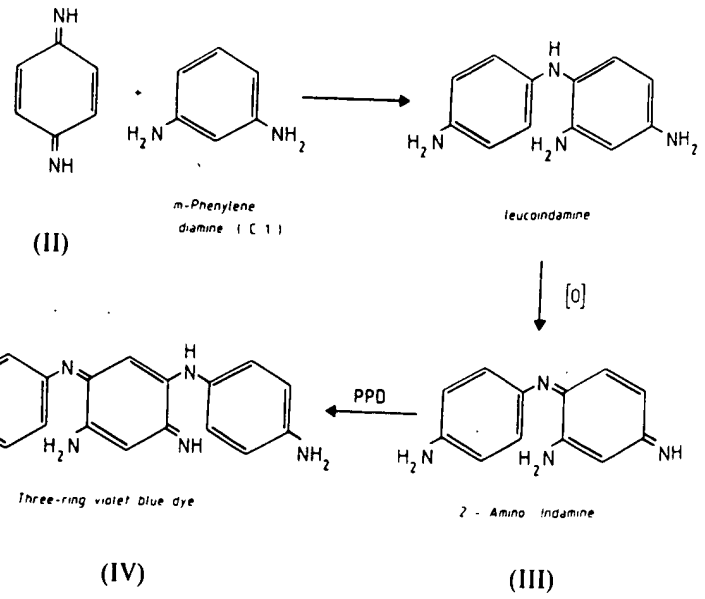
(2)

B. Cooxidation of *p*-Phenylenediamine with *m*-Phenylenediamine

Cooxidation proceeds through a four-step pathway:

1. Formation of quinone diimine as shown above through oxidation of *p*-phenylenediamine.

2. Formation of leucoindamine from the reaction of *m*-phenylenediamine with the quinone diimine.
3. Through oxidation, the leucoindamine yields a blue aminoindamine [III].
4. The aminoindamine condenses with *p*-phenylenediamine, producing a three-ring violet-blue colorant [Eq.(3)IV] which then may condense with [Eq.(3)III] or undergo other oxidation/condensation sequences to give poly-ring pigments.



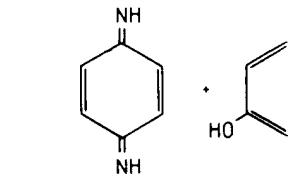
(II) (3)

(IV) (III)

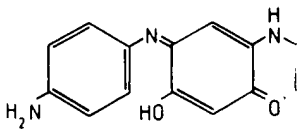
C. Cooxidation of *p*-Phenylenediamine with Resorcinol

1. The reaction [Eq. (4)] of the quinone diimine with resorcinol produces a leucoindophenol readily oxidized to indophenol [V].
2. Through condensation with PPD, the indophenol produces a three-ring green dye [VI], which again may react with indophenol [V] or enter a further oxidation-condensation or coupling cycle.

A similar reaction scheme can describe oxidative coupling of PPD with *m*-aminophenol, which yields the two-ring dye indoaniline (VII) in a first step.



(II)



(VI)

III. FORMULATION OF

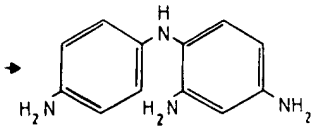
Knowledge of the complex
quinones, quinoneimines, indo
useful in the formulation of h
the application of this knowled

Laboratory study will dem
But in hairdressing practice,
complete in order to ensure s
and tear or light-fastness).

There is also a time factor. O
weeks, in view of the fact th
repeated every 4–6 weeks. Lab

ion of *m*-phenylenediamine with

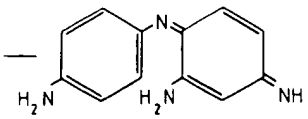
ds a blue aminoindamine [III].
ylenediamine, producing a three-
ien may condense with [Eq.(3)III]
n sequences to give poly-ring



leucoindamine

(3)

[O]



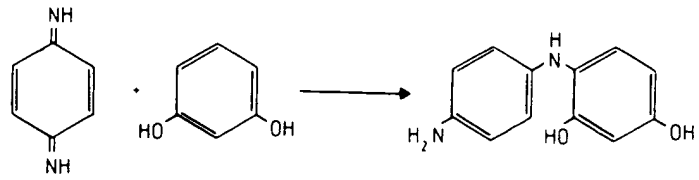
2 - Amino Indamine

(III)

ine with Resorcinol

nine with resorcinol produces a
enol [V].
dophenol produces a three-ring
indophenol [V] or enter a further

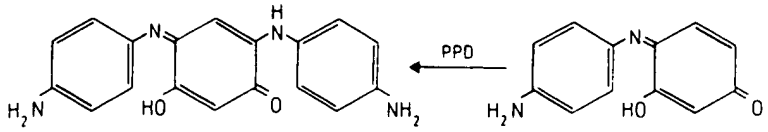
lative coupling of PPD with *m*-
oaniline (VII) in a first step.



(II) Resorcinol Leucoindophenol

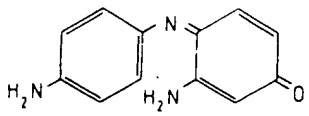
(4)

[O]



Three ring green colorant Indophenol

(VI) (V)



(VII)

III. FORMULATION OF OXIDATION DYES

Knowledge of the complex chemical processes leading to the formation of quinones, quinoneimines, indoamines, indophenols, and phenazines is obviously useful in the formulation of hair dyes. But considerable judgment is required in the application of this knowledge.

Laboratory study will demonstrate the final terms of the oxidation process. But in hairdressing practice, it seems that the chemical reactions must be complete in order to ensure shade stability (notwithstanding resistance to wear and tear or light-fastness).

There is also a time factor. One might be perfectly happy with stability lasting 6 weeks, in view of the fact that new hair grows in and that applications are repeated every 4–6 weeks. Laboratory results might be interpreted as a rejection

testosterone intramuscularly or subcutaneously. The volume of the sebaceous glands is markedly increased, and a greasy condition is produced [28,29].

In both cases the animals are conditioned over a period of 2–3 weeks. They are divided into two groups, one being a control group. After a defined treatment period using the ingredients under test, the effect on the number and size of sebaceous glands and the production of sebum is evaluated.

Histological techniques are employed to visualize and measure the effects on the sebaceous glands. Lipid biosynthesis can be followed by biochemical analyses using ^{14}C-labeled precursors (glucose or sodium acetate) [30a,b]. The amount of sebum excreted is assessed either by solvent extraction techniques [31] or a photometric method (discussed in Sec. III,E).

III. TESTS ON FINISHED PRODUCTS

A. Safety

General Approach

All finished cosmetic products must be evaluated for safety in use to make sure that they do not, under normal and foreseeable conditions, constitute a potential hazard for the consumer. Most countries have provided regulations for such testing. Ingredients can be used in a variety of finished products. It might seem that a sensible way of proceeding would be to conduct most toxicological tests on the ingredients, which would reduce the amount of experimentation and cost of developing finished products. However, experience has shown that the formulation itself is the important element. It determines local tolerance after a single or repeated application, eye and/or lung mucosa tolerance, the degree of absorption through the skin, etc.

Apart from the effects of the vehicle, it has been observed that the association of different compounds can produce either synergistic toxicity or, on the contrary, a mitigation or even inhibition of toxic effects.

Another basic fact that must be kept in mind is that some compounds may undergo chemical modification when used. This is the case with oxidation dyes, for example, which are mixed with an oxidizer in an alkaline vehicle prior to use. Dilution at the time of use is another factor to consider; it is capable of modifying adverse effects to a notable extent.

It is difficult to set up fixed protocols for safety evaluation, because exposure can vary considerably between products, and a rigid protocol would not be appropriate for all products. In all cases the bulk of the testing will focus on tolerance. In some cases, additional testing might be necessary: when totally new ingredients are used, or known ingredients whose physicochemical characteristics have been changed as a result of formulation, or ingredients whose absorption

rate may be significantly altered by the vehicle or by previous hair treatments, or ingredients belonging to a class of compound under suspicion from a toxicological standpoint.

The toxicological profile of a product must be established in accordance with its anticipated use. This is of prime importance. It is unrealistic to establish a single list of tests to be performed on all categories of product. Some tests are common for all products, but specific tests must be introduced according to a product's intended use. An interesting approach to this problem has been developed in France by the Ministry of Health (see Appendix).

If the product under test belongs to a homologous series—as in the case of a dye formulary, which may include up to 60 shades—safety tests will be performed on typical products containing all the ingredients at the maximum usage concentration in a product.

The interpretation of test results should take into consideration all the accumulated human experience with respect to products on the market for years without producing untoward side effects. For this reason, scientists try to range the product safety in comparison with reference products of similar nature and identical use, whenever possible.

Common Safety Tests

The methods are described above in the section on ingredients. In addition to acute oral toxicity, carried out to determine the consequences of accidental ingestion, local tolerance is the most important criterion. It is necessary to determine the product's potential to induce irritation in skin and mucosa after single or repeated applications, taking actual conditions and frequency of use into account, as well as the sensitizing potential.

Specific Tests

Inhalation. This is a concern for products sold in aerosol form. The studies are carried out in a glass or stainless steel chamber in which the product is sprayed so as to reach the desired concentrations in the atmosphere. The animals (rats) are placed in these chambers for six hours. They are allowed to move freely, and this favors product inhalation.

Acute toxicity is determined by observing the mortality rate during 14 days after exposure; similarly, the toxicity of cumulative doses through successive exposures is assessed [32a,b]. Hematologic analyses, macroscopic and microscopic examinations of the viscera and different parts of the respiratory system, and especially a histological study of the nasal cavity, trachea, and lung, are performed.

Percutaneous Toxicity. Most hair products come into contact with the scalp for a relatively short time: They are applied and then rinsed out. The probability of their being absorbed is therefore extremely small (see Chap. 9). This leads to

the question as to whether it is ne
Bourrinet states that "percutan
required" [33].

It is up to the scientist to decid
of the product composition, the a
and the results of the tests pr
percutaneous toxicity tests on fin

1. Single application toxicity:
(sides and back), and the produc
zone remains covered for 24 hr. T

2. Subacute toxicity: The pr
to rabbits for a 4-week period fo
above. The assessment includes v
analyses and histopathological st

Human Data

There are obvious ethical reasons
However, observations made o
extrapolating data from animals t
irritation and sensitization poten
interest.

The techniques employed are c
will not be discussed here.

B. Microbial Contaminat

One of the requisites that must b
absence of contamination by micr
organisms, or organisms that mi
alterations rendering the product

It is difficult to define eithe
saprophytes present in the enviro
the scalp, a germ-rich area.

Formulation is normally carri
bacterial contamination that can
use. Action is taken at two levels:
further contamination at the time

The finished product must inc
The choice of preservative is com

1. Be effective against a wide ra
2. Retain a constant level of acti
3. Be compatible with the comp

Library of Congress Cataloging-in-Publication Data

The Science of hair care.

(Dermatology ; v. 7)
Includes bibliographies and index.
1. Hair--Care and hygiene. 2. Hair--Diseases.
3. Scalp--Diseases. I. Zviak, Charles. II. Series:
Dermatology (Marcel Dekker, Inc.) ; v. 7.
RL91.S45 1986 646.7'24 87-5343
ISBN 0-8247-7378-0

MARCEL DEKKER, INC.
270 Madison Avenue, New York, New York 10016

Current printing (last digit):
10 9 8 7 6 5 4

ISBN 0-8247-7378-0

PRINTED IN THE UNITED STATES OF AMERICA

For decades ther
and pathology o
publication of se
usually very tecl
specialists. They
knowledge.

Charles Zviak
planned to prod
problems related
physicians, phar
chemists and oth

He has himsel
and technology
with physiology
dermatologists fr
achieved by his t

The publicatio
Increasing numb
dermatologists fo
conditions but al
knowledge of h
composition and
and shape of h
conditions and h
dermatologist's e
diseases of hairdr